Atmospheric Radiation Measurement (ARM) User Facility

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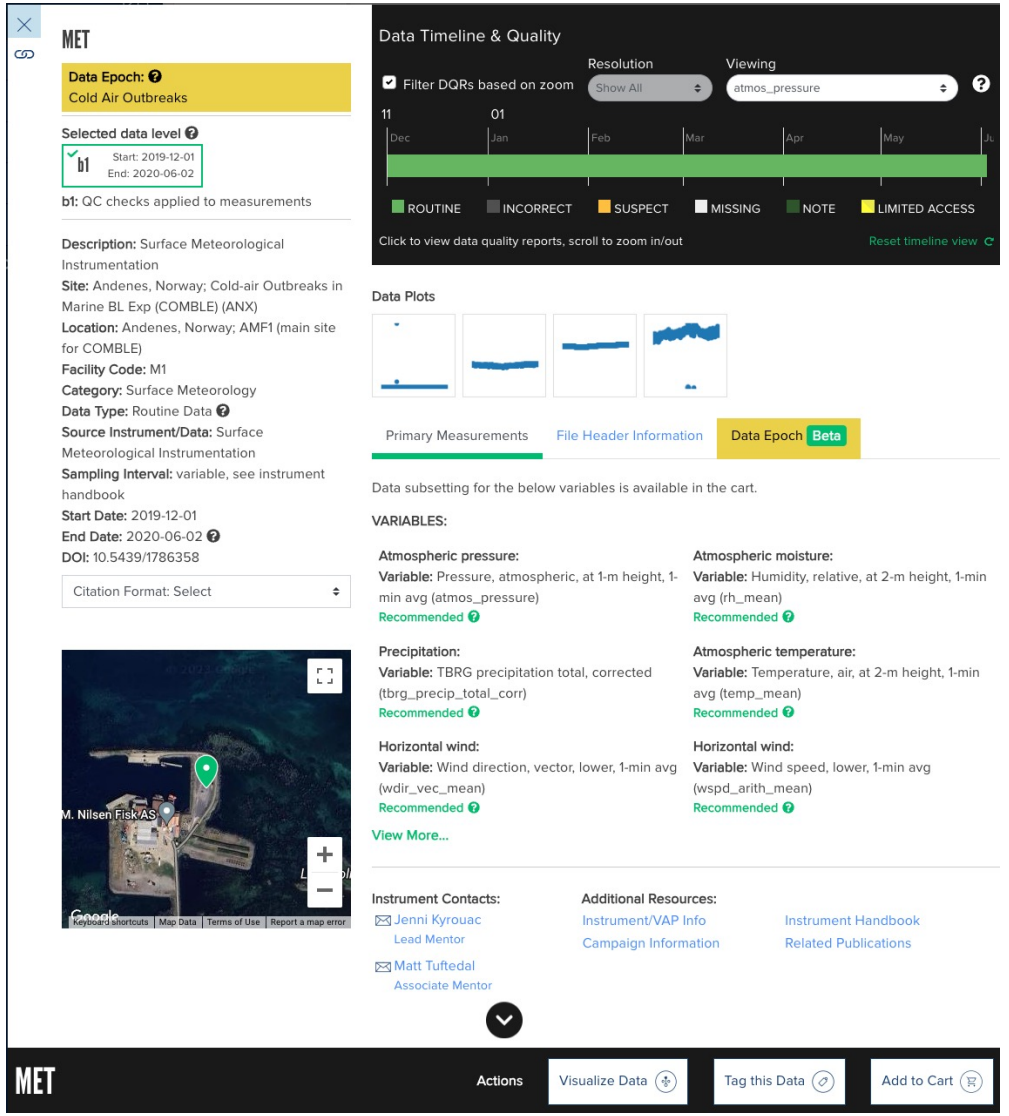
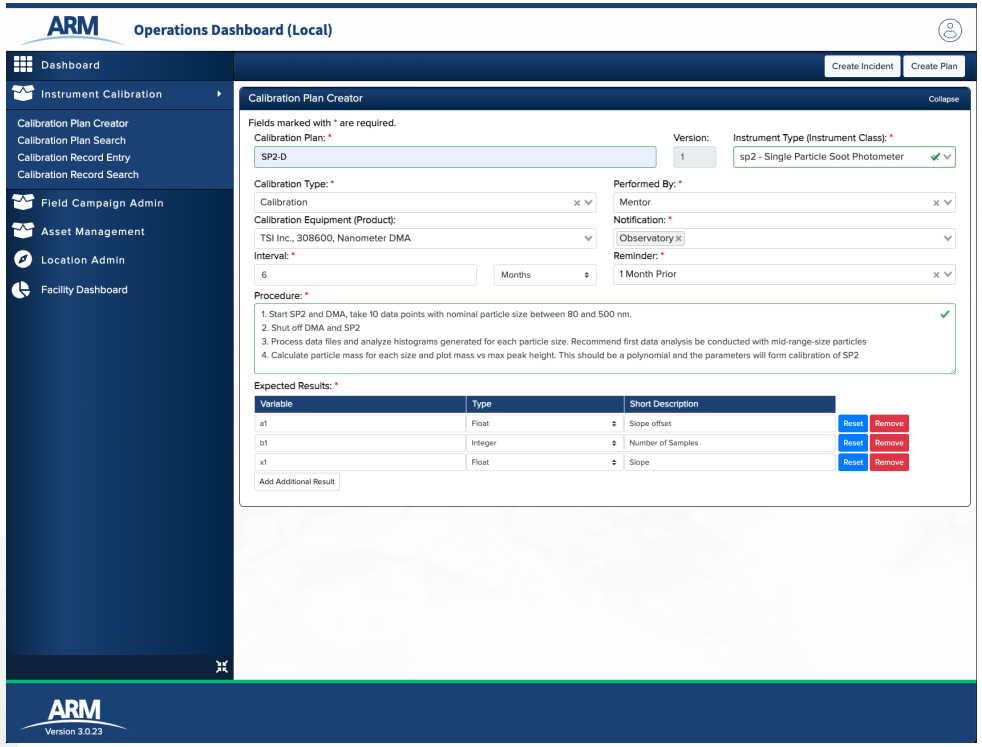
Tools For Future

- ARM tool development is working to get each piece of this data efficiently captured for efficient propagation to all tools
- Future filtering and customization of information
- Interfaces for user, mentors, translators, management
  - Troubleshooting
  - Discovering
  - Monitoring
  - Data Analysis



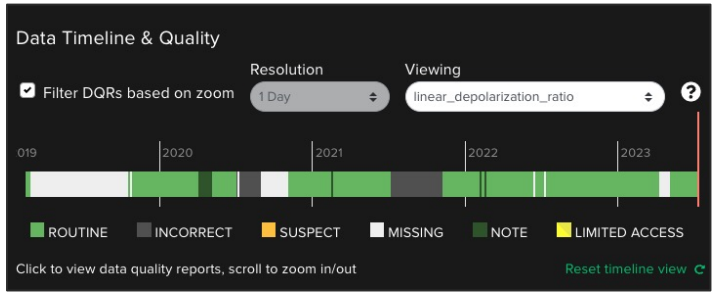
New ARM Calibration System

- Digitizing Calibration Plans
- Assigning Calibration Events to Assets
- Dissemination of Calibration Information
  - Data Discovery
  - Public-Facing Record Viewer
- Communication Strategy
  - Webpage
  - News Stories
  - Webinar

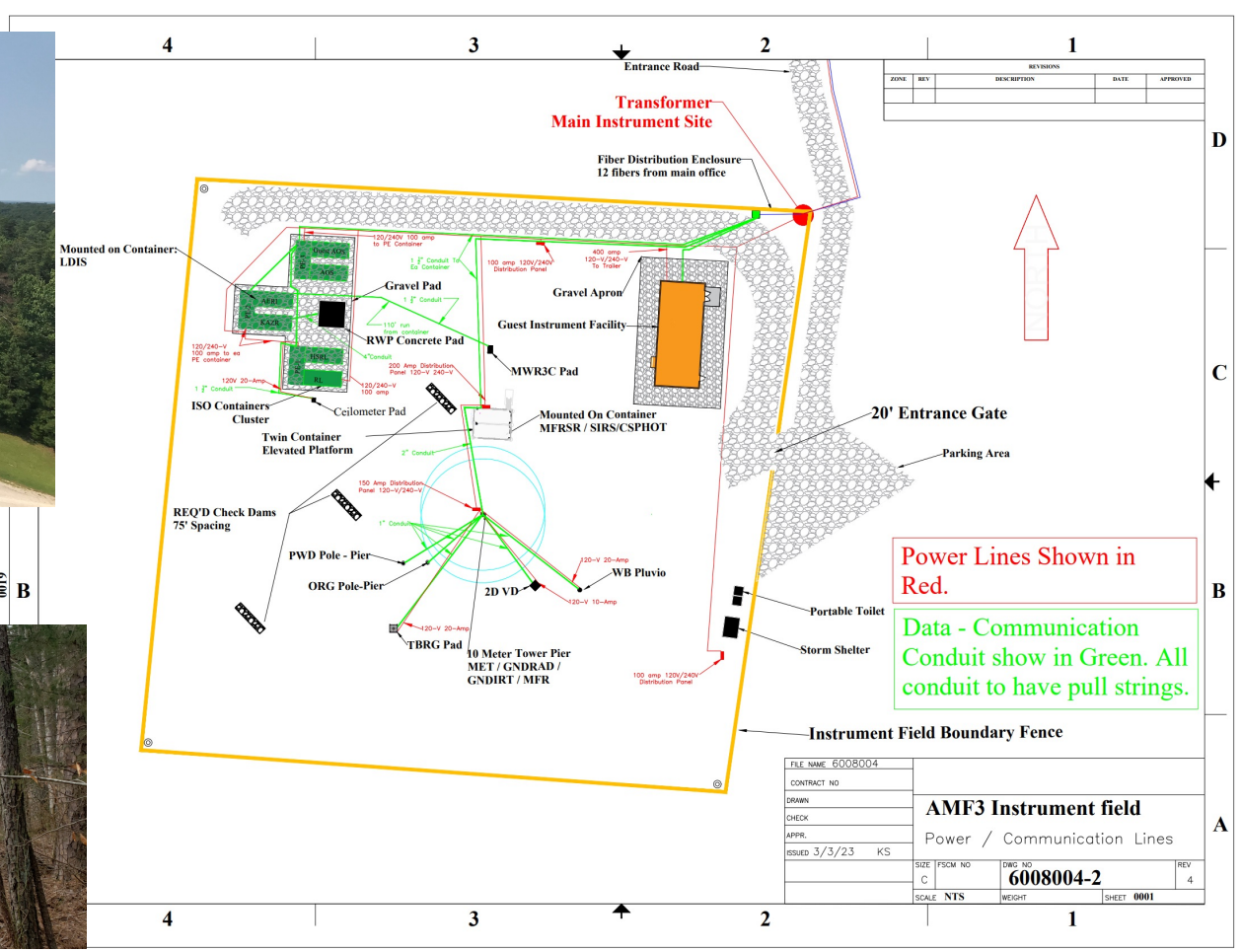


Each asset has a unique ARMID that reports can be linked to

No matter where it goes or what system that asset is installed in, these reports will be connected to that ARMID



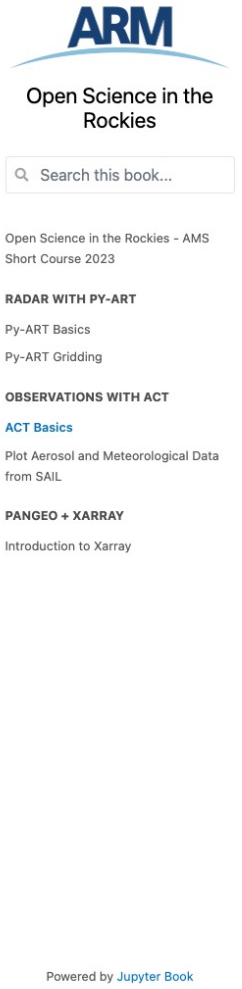
AMF3 Bankhead National Forest (BNF)

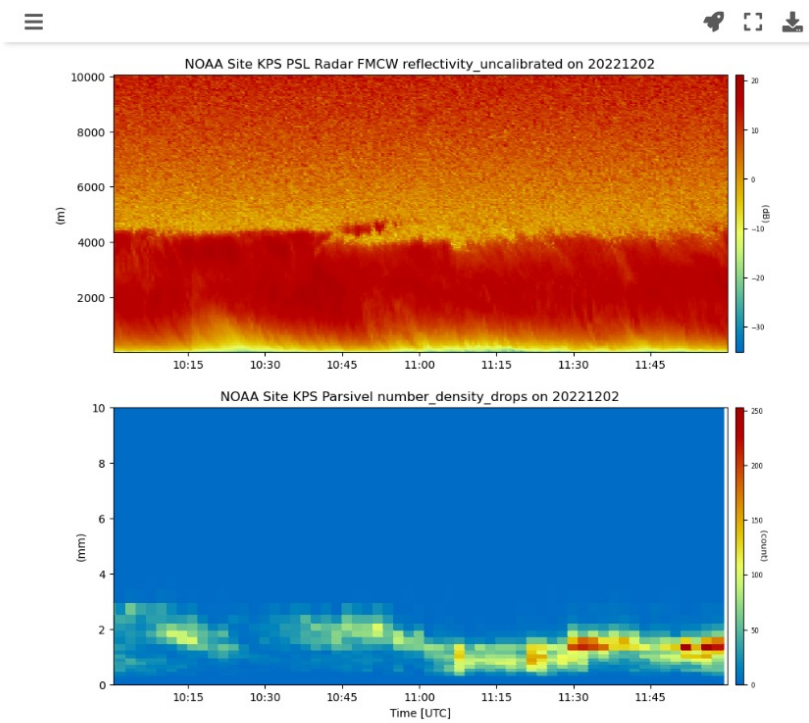


https://www.arm.gov/capabilities/observatories/bnf

Workforce Development Coordination

- Collaborative short courses, workshops, tutorials, and su
- Available & reusable educational material & examples
  - https://arm-development.github.io/ARM-Notebooks
- Past Events:
  - AMS Annual meeting short course
    Open Science In the Rockies (Dan Feldman)
  - AMS Radar Meeting: Open Radar Science
- Future Events:
  - AMS Annual Meeting
  - FY25 ARM summer school





In-Situ Precipitation Accumulation at the AMF2 site

```
username = 'armlive_training'
token = '6f097a7b99e39d19'

# Access the laser disdrometer data
laser_disdrometer_files = act.discovery.download_data(username=username,
                                                      token=token,
                                                      datastream="gucldM1.b1",
                                                      startdate="2022-12-02",
                                                      enddate="2022-12-02")

# Read the laser disdrometer data into an xarray dataset
laser_disdrometer_ds = act.io.read_netcdf(laser_disdrometer_files)
```

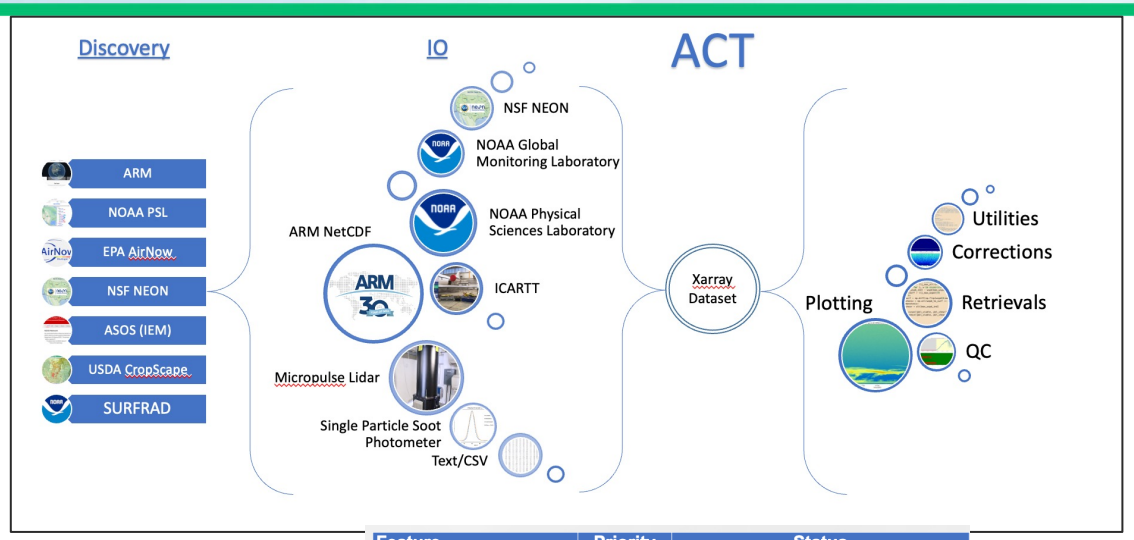
Open Source

https://github.com/ARM-Synergy
https://github.com/ARM-Development
https://github.com/ARM-DOE

- ARM data Community Toolkit (ACT)
- Python-ARM Radar Toolkit (PyART)
- ARM data-oriented diagnostics package for climate model evaluation
- ARM data integrator
- Camspec-air

Related Open Source Highlights

- PyFLEXTRKR (Python FLEXible object TRacKeR)
- EMC2 (Earth Model Column Collaboratory)
- tobac (Tracking and Object-based Analysis of Clouds B)



Feature	Priority	Status
Aircraft or UAS Related Functionality	High	Ability to read ICARRT data added but no work on visualizations or quality control yet
Retrievals	High	PBL Height using Heffter method SP2 retrievals using PySP2
Windows Compatibility ✓	High	Continuous integration tests running on windows VMs
ARM Data Surveyor ✓	High	Command line interface for basic ACT plotting now in ACT's scripts directory
Performance Improvements ✓	High	Implemented Lazy Loading to greatly improve import speed.
Statistics Tracking ✓	Medium	Logging daily statistics from GitHub traffic
I/O Improvements	Medium	NOAA, NEON, and SURFRAD readers were added but more could be done
Tutorial and Example Development ✓	Medium	New and improved example gallery with expanded examples
Discovery Improvements	Low	NOAA, NEON, SURFRAD, EPA discovery modules but more could be done
Visualizations	Low	Violin, scatter, and groupby plotting functionality added in but more is needed (Pie, interactive, etc...)

Table 1. Priorities and current status of tasks from the second ACT roadmap. ✓ indicates tasks that the ACT development team considers complete.